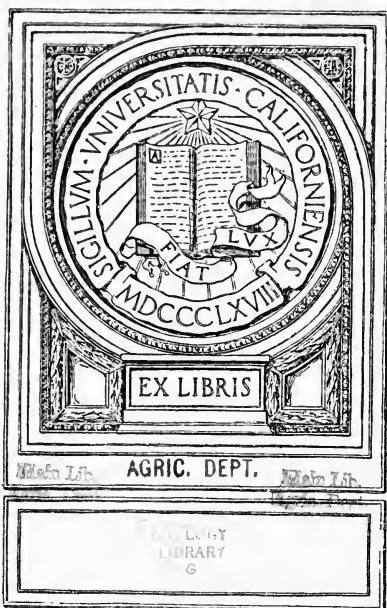
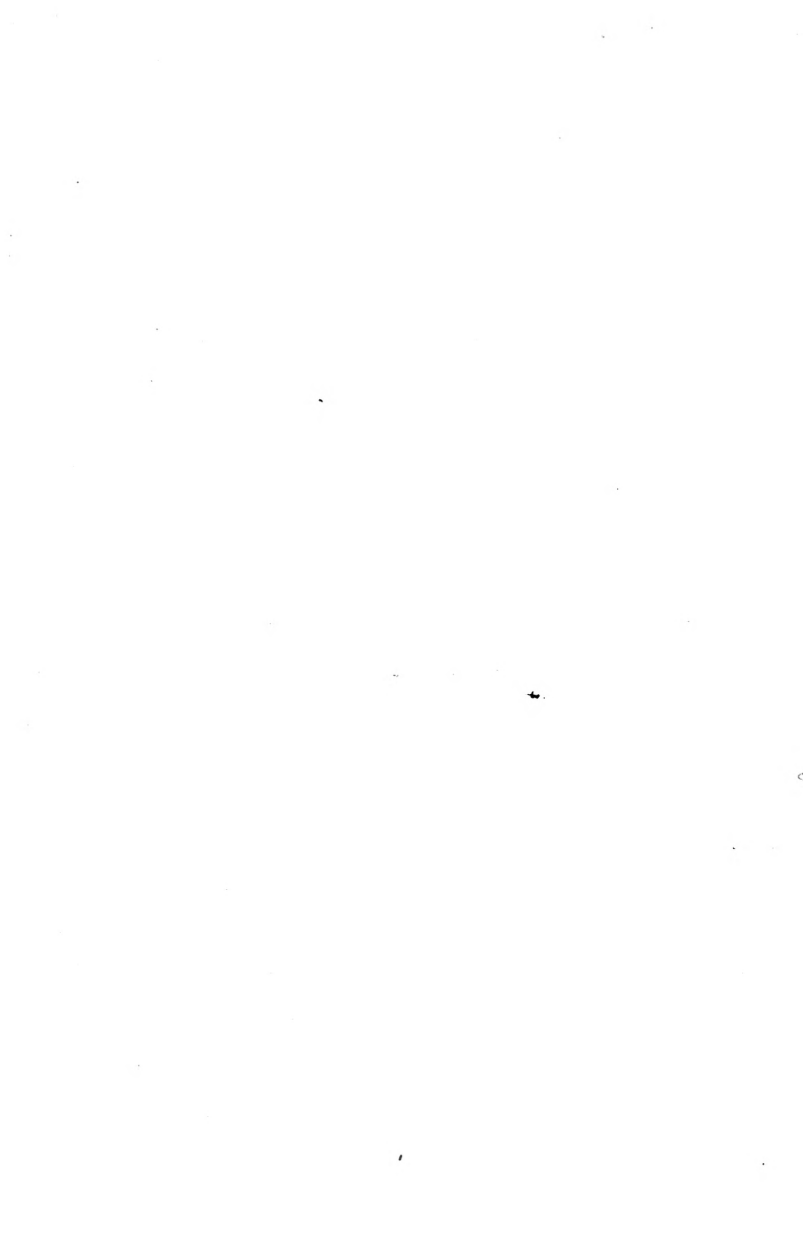


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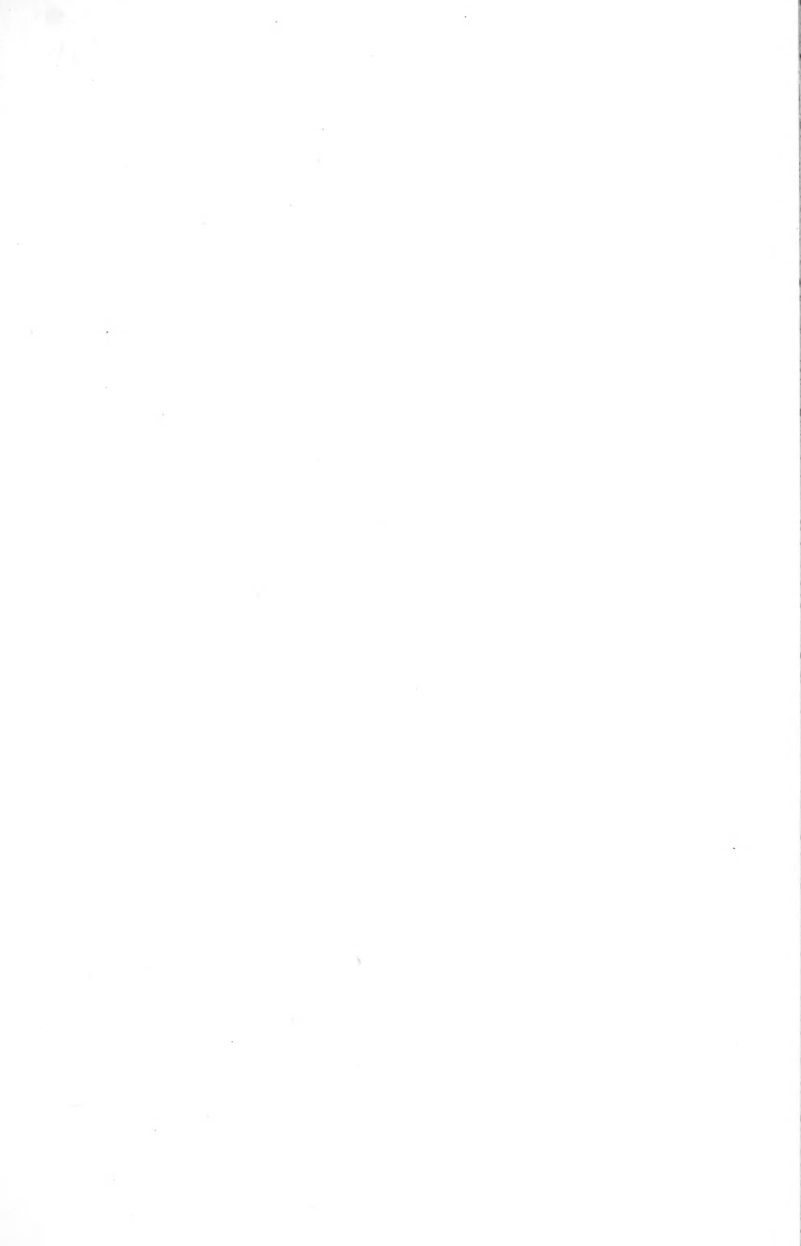


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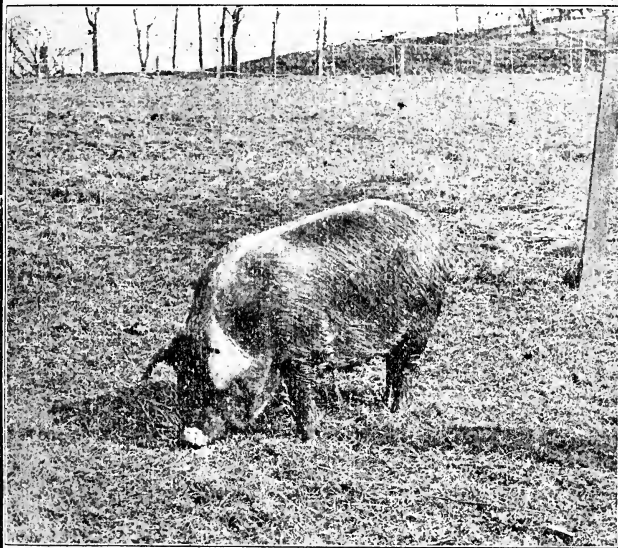




OF THE
COLLEGE OF
AGRICULTURE

Hog Cholera

It's Prevention and Control



BY

West Virginia Experiment Station

DR. C. A. LUEDER, Veterinarian

PUBLISHED BY

DEPARTMENT OF AGRICULTURE

H. E. WILLIAMS, Commissioner

JUNE, 1913

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Department of Agriculture on the Control of Hog Cholera

In the publication of a bulletin on Hog Cholera, it seems only fitting that in connection therewith I outline the general policy of the State Department of Agriculture in relation to the Control or Prevention of the Disease.

As a preventive measure we will at present make no effort to vaccinate free of charge all the hogs in the State, or even those whose owners apply to this department for such treatment, except in the case of an outbreak of the disease, but we will furnish the Hog Cholera Serum to all hog owners within the state who apply for same, at actual cost and postage, and in the event of an outbreak of Hog Cholera we will furnish Hog Cholera Serum and one of the consulting Veterinarians of this department to vaccinate and quarantine, not only the diseased herd but all hogs within reasonable distance of the outbreak, free of cost to the owners on condition that they will agree to abide by and put into effect the rulings of the Department of Agriculture and the instructions of the consulting Veterinarian as to disinfection and quarantine, and will exert all reasonable efforts to assist in the control and eradication of the disease.

The Department of Agriculture is ready to assist in every possible way, but it must be borne in mind that without the co-operation of the property owners our efforts will avail but little. Whenever there is an outbreak of Hog Cholera it should be immediately reported to this department in order that steps may be taken for its control.

H. E. WILLIAMS,
Commissioner of Agriculture.
Charleston, West Virginia.

Morgantown, W. Va.

June 10, 1913.

Hon Howard E. Williams,

Commissioner of Agriculture,

Charleston, West Virginia.

Sir:—

I have the honor to hand you herewith the manuscript of a bulletin on Hog Cholera, Its Prevention and Control, prepared by Dr. C. A. Lueder, veterinarian of this Station. This bulletin is the result of experimental work carried on last year in co-operation with the State Board of Agriculture. Inasmuch as the control of live stock diseases is under your supervision it seems fitting that this bulletin should be published from your office and this Station appreciates your courtesy in the matter.

Very truly yours,

E. D. SANDERSON, *Director West
Virginia Agricultural Experiment
Station.*

INTRODUCTION.

The West Virginia Agricultural Experiment Station receives a large number of inquiries and letters each year in regard to symptoms, prevention, treatment and all other particulars pertaining to hog cholera.

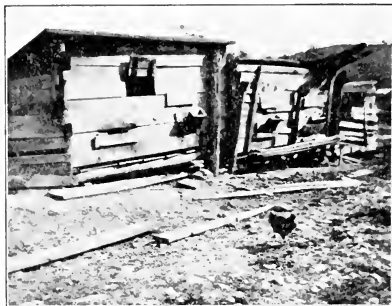
In order to obtain definite data on these subjects a series of experiments were undertaken by the Veterinarian of the Station in co-operation with the State Board of Agriculture. These experiments were conducted in 1912 on thirteen different farms and a total of 188 hogs were treated and observed.

The purpose of this circular is to set forth these results as to convince the farmers and hog raisers of this state that whenever hog cholera is prevalent in any particular neighborhood, it can be kept under control and no hogs be lost from this dread disease if they (first) see to it that the disease is positively diagnosed by a competent veterinarian; if they will (second) give their hogs better sanitary conditions,—that is, cleaner, dryer yards and pens well disinfected; and if they will (third) vaccinate all hogs according to directions with cholera serum before they become exposed to the disease.

Hog Cholera

CAUSE OF DISEASE.

The direct cause of hog cholera is a germ or organism which is so small that it will pass through a porcelain filter and even yet,



Where cholera broke out, showing chicken spreading disease germs.

due to their extreme smallness, the germs that cause the disease have never been seen with a microscope.

The prevalence of cholera among hogs can be accounted for by the way in which farmers and hog raisers usually care for these animals. In neighborhoods where the disease is prevalent over eight per cent of the outbreaks will first appear in those hog houses and lots where a wet, muddy, filthy, ill-smelling condition exists. This is an ideal place to breed and harbor the disease and if these conditions could be prevented it would be an easy matter to control hog cholera.

The germ is always present in the blood of diseased hogs and is also present in their saliva, urine, manure and in fact all excretions from their bodies.

When these germs are set free in the filthy pens and muddy yards, conditions are exactly right so that everything that touches or comes in contact with these pens and yards will become covered with the germs and thus spread the disease throughout the neighborhood. Cattle, horses and wagons when driven through the infected yards which the hogs frequent, may carry the disease. Buzzards, because of their habits of feeding in hog lots; poultry, pigeons, wild rabbits, dogs, foxes, skunks and even people traveling from one farm to another, may carry the disease to the next neighbors. Hogs bought in an infected neighborhood and about to

come down with the disease, if allowed to run at large on the common or in the mountains may carry the disease. This same effect often results from transporting breeding animals into an infected neighborhood for service and then returning them to their home



Disinfecting shoes before leaving cholera infested farm.

pens. Hogs bought at fairs and stock shows, may look well and hearty but may have been exposed in the cars in which they were shipped or in the pens in which they were exhibited, and when taken home without being in quarantine for three weeks, will infect the home herds. Small streams running through and draining infected yards are common carriers of disease. Dead carcasses of hogs are often times the means of infection, when taken to the



**Dogs will carry the disease from one farm
to another**

field or wood lot and allowed to decompose and be eaten by animals or buzzards which in turn may carry the organisms of the dead carcasses on their bodies and drop pieces of the infected flesh over the surrounding farms. The buzzard will drop his manure or light and wipe his filthy infected feet in the nearest hog lot or throw up the infected contents of his crop on an enemy as a means of protection, and then fly away to infect another neighboring farm.

THE INCUBATION PERIOD.

The incubation period is the length of time between the exposure of the hog to the disease and the development of the first signs of sickness in the hog. This varies from a few days to two or three weeks and depends somewhat on the age of the animal, its physical condition, the way in which it is exposed to the disease and the strength and vitality of the germ causing the disease. In the beginning of an outbreak, the germs are usually the strongest and after the disease has run a course of two or three months it may lose its strength and not attack the hogs that are three or four years old.



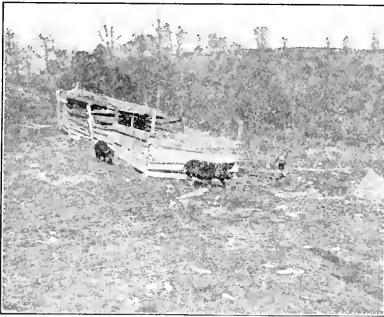
Rail pen showing where eleven shoats died from cholera.

SYMPTOMS.

When hogs are becoming sick with cholera, the first thing the farmer will notice is that some of them become gaunt and their

ears and tails droop. They will eat sparingly acting as though they eat because the rest eat and not because they are hungry. They are always the first to lie down after eating and usually go off by themselves, hide in the litter and lie quiet.

In from three to five days after the first symptoms show, the animal may entirely refuse food, or may come with the rest when called, but on close observation the sick hog will show signs of weaving or staggering behind. Sometimes they are unable to rise at all. The animal may either have diarrhoea or be constipated. As time goes on, the hog will become very thin, ears lop down, eyelids becoming swollen and often having a sticky gluey discharge around the edges. The skin may become rough, wrinkly and dry. Sometimes, scabs and sores come on the ears and back. In white hogs, the belly, ears, throat and inner side of the legs often appear red or purple colored, while in black hogs, or if the skin is black in the above described regions it will be impossible to see the purple color.



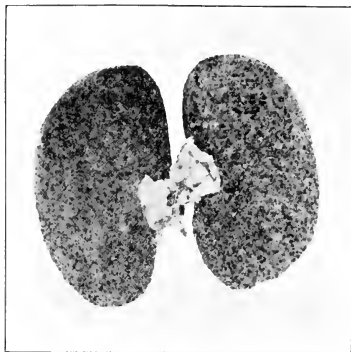
Two vaccinated sows that had free access to outside of the above open pen and did not contract disease.

In the beginning of an outbreak it is impossible for one to tell positively if the sickness is due to hog cholera. The only definite way for the farmer to tell is to kill the animal or wait until just after natural death, then open the hog by cutting away the ribs and upper side of the abdominal wall with a sharp axe. This will expose the heart, lungs, liver, stomach, intestines, kidneys, etc.

It must be remembered that typical hog cholera signs are not seen in every sick hog that has been killed or has died. The farmer must not come to the conclusion on the first hog opened that the trouble is not hog cholera, because the disease shows itself in so many different ways that it may require the examination of some-

times as many as four or five hogs to tell positively that the disease is hog cholera.

In the acute form of the disease, the cholera signs are usually seen as small red blood spots, caused by rupture of the capillary walls. These spots are from the size of a pin point to a pin head and are found on the liver, spleen, lungs, intestines and especially on the kidneys. After the thin skin that covers the kidneys is removed these spots, which cannot be wiped or rubbed off, give the appearance of a turkey egg. Sometimes these spots are very small and only a few in number; therefore, the kidneys should be exam-



"Turkey egg" appearance of cholera diseased kidneys.

ined very closely. On the other hand, they may be large and easily seen. From the farmer's point of view, these signs should serve as a positive diagnosis that his herd has cholera.

At this point, the veterinarian should be notified and a call made to make absolutely sure that the disease is hog cholera, and then see to it that all precautions prescribed by law are carried out to the letter and advise the neighboring farmer of the danger so as to cut off all possible ways and channels of the germ being carried from the infected pens to the neighbors' herds.

On the other hand, if the disease is not reported immediately to the veterinarian so that he can take all the necessary precautions, the disease will spread all over the surrounding country in a very short time.

PREVENTIVE MEASURES.

Hog Cholera is the most deadly and widespread disease of hogs in the state and for this reason all possible precautions should be

taken to prevent its spread. Proper houses, yards, feeding and care must be provided to keep the herd in a healthy growing condition.

Healthy hogs naturally resist almost all diseases and have a slight resistance against hog cholera, but filthy crowded pens and yards with lack of exercise and poor feeding overcome this resistance and are a secondary cause of the spread of the disease.

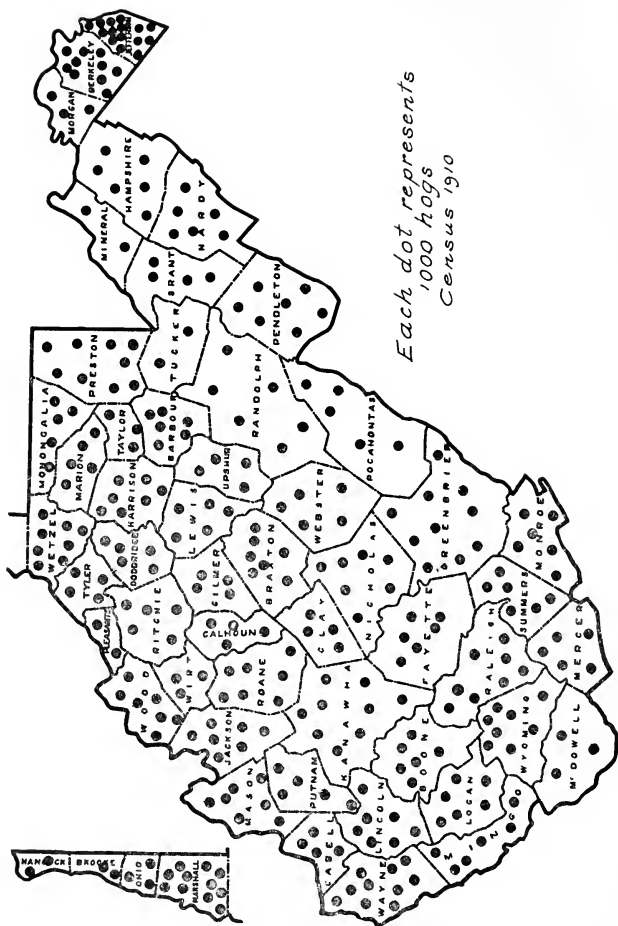
There are two things necessary to keep hog cholera out of the herd. The first is to keep away from the hogs the germ that causes the disease. The second is to increase the resistance of the hog to the organism so that if it does happen to come in contact with the germs it will resist the disease. To provide the necessary precautions, care must be given to the foods, yards, drinking water, trough and floors. If the food is from the slops of boarding houses or hotels it should be cooked for fear that it may contain pieces of raw infected pork that have come from the western packing houses.

The cooking kills all germs and this reduces the chance of infecting the hogs with any disease from this source. Yards that are not well drained and become muddy are not fit for use after the first year because soil becomes so full of organic matter that it be-



Using the disinfected artificial hog wallow.

comes filthy, ill smelling and unhealthy. Each year new yards should be provided and the old ones plowed up and sowed with some forage crop. The wallow hole is one of the most essential features of a hog lot during the summer months and it is always



the most filthy part of the yard. The wallow should be artificially made of planks or cement and kept well filled with clean water containing a disinfectant of creolin—one ounce to one gallon of water. This should be cleaned outside of the yard and refilled about every ten days.

Streams draining from lots higher up should not be allowed to run through the yards. Feed troughs and floors should be kept free from stale food, corn-cobs and wet litter.

There is no place on the farm where disinfectants are as necessary as in the hog houses and yards. Carbolic acid—one tablespoonful to two gallons of water, or creolin—two tablespoonfuls to one gallon of water make excellent disinfectants. Whitewash containing sulphur and creolin in any proportion desirable, used on the inside of the pen makes one of the best disinfectants.

Hogs newly bought or coming from other herds should be kept entirely separate from the home herd for at least three weeks. During this time they should have a different care-taker and separate utensils should be used for feeding and caring for the animals.

The question is often asked by farmers, "How long before new hogs can be safely put into pens that have been infected?"

New hogs should not be put on the same farm for at least three months and not in the old pens for one year. New pens and yards should be provided at least one hundred yards from the old pens.

The old yards should be limed, plowed and planted and the old pens should be burned or whitewashed and disinfected as described above.

Each hog should be thoroughly sprinkled, using a garden watering-pot of disinfectant, composed of two tablespoonfuls creolin to one gallon of water.

The second essential in keeping hogs free from cholera is vaccination with cholera serum before they become exposed to the disease.

The method of vaccinating hogs for hog cholera should be understood and carried out by the farmer or hog raiser just as the farmer vaccinates his calves for black leg. The object of vaccinating and the methods used are just the same, except in black leg the new and up-to-date method is to use a pill, where in hog cholera a certain quantity of serum is used for every pound of hog flesh. The farmer can estimate the weight of his hogs and give the measured amount of serum just as well and as efficiently as the veterinarian, as long as he follows out the directions laid down in this bulletin.

The results will be just as good and as lasting as if he paid a professional fee for the same.

INSTRUCTIONS FOR VACCINATING.

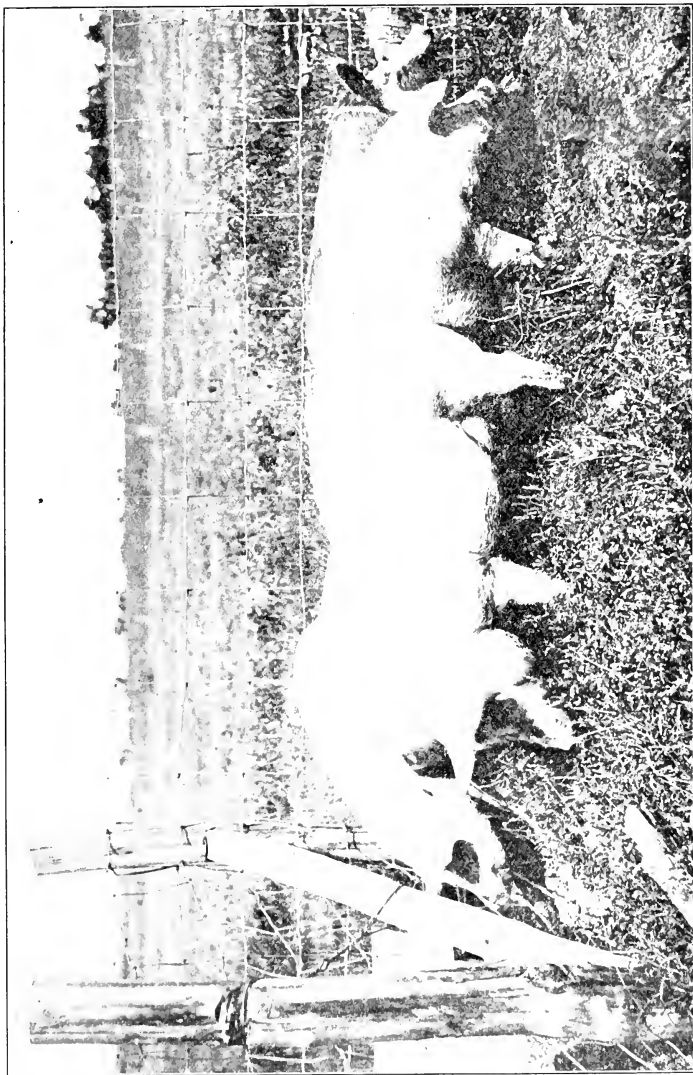
Great care should be exercised in estimating the weight of the hog because on this must depend the amount of serum to be used. If the weight is estimated too low, and too small a dose of serum is used, that hog is in as much danger of taking the cholera as if it has no serum at all. On the other hand, if the weight is given too high and too much serum is used, there is no harm done to the hog.

If the disease is already present in the herd, great care should be taken in separating the sick animals from the well. The only way to make sure of them is by the use of the thermometer. Shake the thermometer down each time before using and insert into the rectum for two minutes, remove it and read the temperature. All hogs that show a temperature of 103 degrees or more, should be left in the pens and all having a temperature under 103 degrees should be disinfected as described above, removed to new quarters, given warm dry pens, a dry yard and then vaccinated with a *double* dose of serum. The sick hogs should be left in the old pen which is then disinfected and boarded up tight so that rats, poultry, birds, etc. cannot enter. As fast as the hogs refuse to eat, they should be taken to a convenient place where a big fire can be built and the animal killed and the carcass burned.

It must be remembered that while people and all farm animals can handle or be continually in contact with the sick hogs and not take the disease, yet they can carry it to other hogs. This being the case, the farmer need have no fear of taking cholera in opening the carcass to look for the spotted liver and kidneys as described above. In bleeding and opening the dead carcass, it should be placed on top of the wood pile so that all liquids and pieces of flesh can be burned, even the water after washing the knife and hands should be thrown on the fire to make sure that dogs, chickens, etc. will have no chance to carry the germs to other pens.

THE VACCINATION.

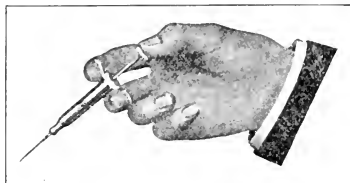
Great care should be taken to boil the syringe and wash the hands thoroughly in the disinfectant described on page 12. The serum should be warmed to body temperature.



160 pound hogs requiring 35 cubic centimeters of serum.

The hogs should be put in a clean pen and an assistant should be at hand to catch and hold the hogs, as shown in picture. The inside of one hind leg should be thoroughly washed and the estimated amount of serum injected under the skin.

The hog should be released in a dry yard without a wallow. The latter precaution is necessary to prevent infection which is one of



Syringe commonly used for vaccination.

the causes of abscesses, tumors and sometimes death from blood poisoning. Dirty pens and vaccination by a careless, unclean person may be the cause of the death of many hogs.



Farmers disinfecting hind legs of hog before vaccinating.

Dosage.

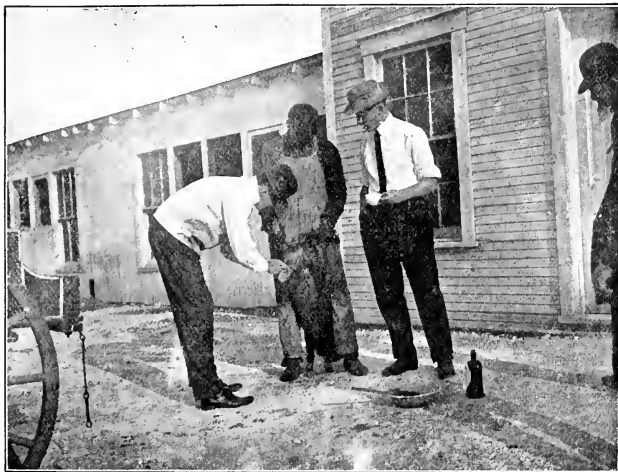
| | |
|-----------------------|-----------------------|
| Suckling pig | 5 cubic centimeters. |
| Fifty pound hog | 10 cubic centimeters. |

Seventy-five pound hog 15 cubic centimeters.
 One hundred pound hog 20 cubic centimeters.

Doses increased proportionally for heavier hogs.

RESULTS.

During the month of October, 1912, three outbreaks of cholera occurred near the Experiment Station. All the hogs within a dis-



Injecting the serum after the disinfecting

tance of one half mile of the outbreaks were vaccinated and close observation of the results was taken. Not a single hog came down with the disease after the vaccinating was completed around the infected territory.

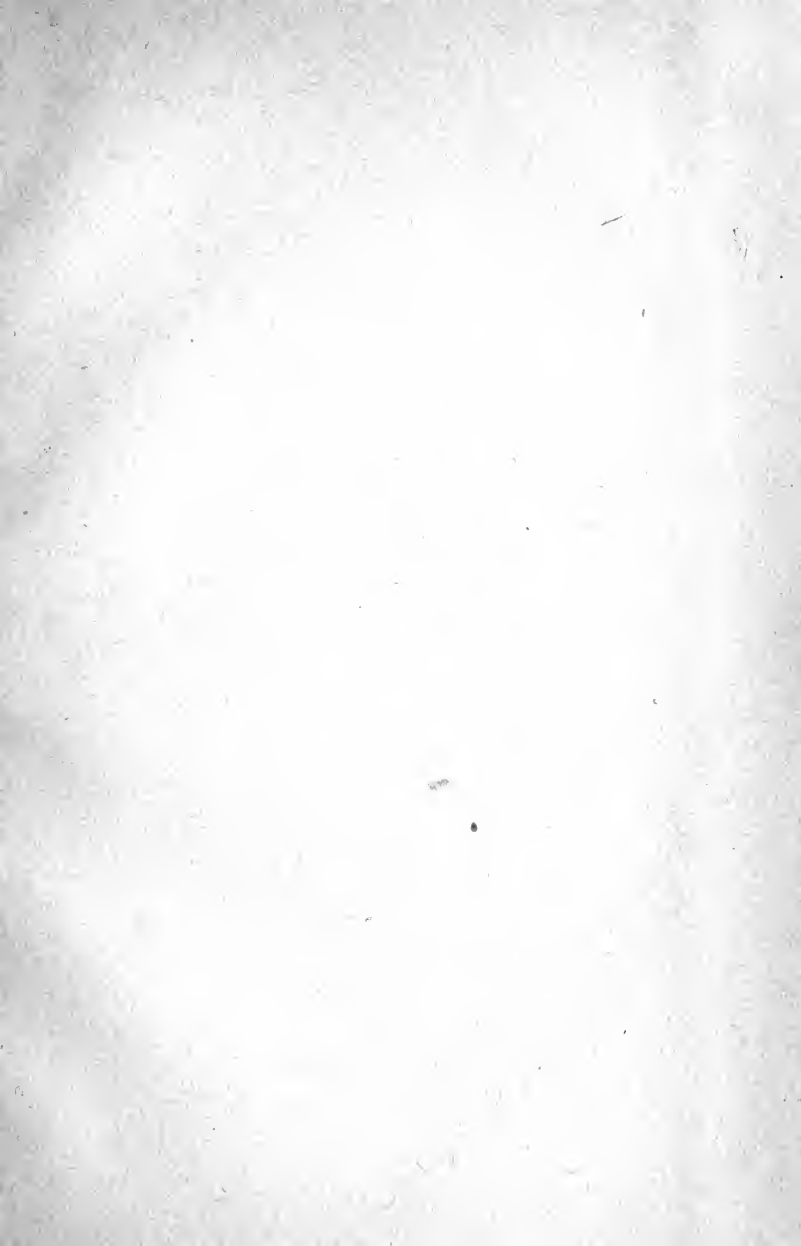
RECORD OF VACCINATION RESULTS ON 17 CHOLERA INFESTED FARMS NEAR THE EXPERIMENT STATION.

| Farm | No. Hogs | No. sick hogs injected | **No. sick hogs not injected | No. healthy hogs injected | No. sick hogs lost after injection | No. healthy hogs lost after injection | Total No. Hogs lost |
|------|----------|------------------------|------------------------------|---------------------------|------------------------------------|---------------------------------------|---------------------|
| * 1 | 16 | 3 | 9 | 4 | 3 | 0 | 12 |
| 2 | 18 | 0 | 0 | 18 | 0 | 0 | 0 |
| 3 | 13 | 0 | 0 | 13 | 0 | 0 | 0 |
| 4 | 8 | 0 | 0 | 8 | 0 | 0 | 0 |
| 5 | 4 | 0 | 0 | 4 | 0 | 0 | 0 |
| 6 | 2 | 0 | 0 | 2 | 0 | 0 | 0 |
| 7 | 16 | 0 | 0 | 16 | 0 | 0 | 0 |
| 8 | 18 | 0 | 0 | 18 | 0 | 0 | 0 |
| 9 | 4 | 0 | 1 | 3 | 0 | 0 | 1 |
| 10 | 4 | 0 | 0 | 4 | 0 | 0 | 0 |
| 11 | 18 | 0 | 0 | 18 | 0 | 0 | 0 |
| 12 | 9 | 0 | 0 | 9 | 0 | 0 | 0 |
| *13 | 14 | 4 | 3 | 8 | 7 | 4 | 14 |
| *14 | 28 | 3 | 0 | 25 | 3 | 13 | 16 |
| 15 | 3 | 0 | 0 | 3 | 0 | 0 | 0 |
| 16 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| *17 | 9 | 0 | 2 | 7 | 0 | 0 | 2 |

*Cholera broke out in this herd before vaccinating.

*On Farms Nos. 13-14, apparently healthy hogs were vaccinated and death followed. It was undoubtedly due to the hogs being directly exposed to the disease before being treated with the serum.

**In all cases sick hogs not injected died.









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